

Claims

[c1] 1. A television (TV) tuner comprising:

- a first mixer for producing an intermediate frequency signal according to a received RF signal;
- a notch filter for filtering an image signal of the intermediate frequency signal;
- a band-pass filter for passing the intermediate frequency signal; and
- a second mixing unit for producing an output signal according to the passed intermediate frequency signal.

[c2] 2. The TV tuner of claim 1, wherein the notch filter comprises:

- an inductor coupled between an input and an output of the notch filter;
- a first capacitor coupled to the input;
- a second capacitor coupled between the output and the first capacitor; and
- a resistor coupled to the first capacitor, the second capacitor, and the ground.

[c3] 3. The TV tuner of claim 1, further including a first local oscillator for providing a first local oscillating signal to the first mixer, wherein the frequency of the first local

oscillating signal is variable and is determined according to the frequency range of the received RF signal.

- [c4] 4.The TV tuner of claim 3, wherein the first mixer is a harmonic mixer and the first local oscillating signal further includes a first reference signal and a second reference signal being the first reference signal phase shifted by 90 degrees.
- [c5] 5.The TV tuner of claim 1, wherein the second mixing unit is a mixer and the TV tuner further includes a second local oscillator for providing a second local oscillating signal to the second mixing unit, wherein the frequency of the second local oscillating signal is fixed and is determined according to the frequency range of the received RF signal.
- [c6] 6.The TV tuner of claim 5, wherein the second mixing unit is a harmonic mixer and the second local oscillating signal further includes a third reference signal and a fourth reference signal, the fourth reference signal being the third reference signal phase shifted by 90 degrees.
- [c7] 7.The TV tuner of claim 1, wherein the second mixing unit further includes a third mixer for mixing the passed intermediate frequency signal to generate an in-phase baseband signal and a fourth mixer for mixing the

passed intermediate frequency signal to generate a quadrature-phase baseband signal.

- [c8] 8. The TV tuner of claim 7, wherein the third mixer further includes a second local oscillator for providing a third local oscillating signal to the third mixer and a fourth local oscillating signal to the fourth mixer, wherein the frequency of the third and the fourth local oscillating signal is fixed and is determined according to the frequency range of the received RF signal and the fourth local oscillating signal being the third local oscillating signal phase shifted by 90 degrees.
- [c9] 9. The TV tuner of claim 8, wherein the third and the fourth mixers are harmonic mixers, the third local oscillating signal further includes a fifth reference signal and a sixth reference signal, and the fourth local oscillating signal further includes a seventh reference signal and a eighth reference signal, wherein the sixth reference signal is the fifth reference signal phase shifted by 90 degrees, the seventh reference signal is the fifth reference signal phase shifted by 45 degrees, and the eighth reference signal is the fifth reference signal phase shifted by 135 degrees.
- [c10] 10. A method of processing a received RF signal, the method comprising:

mixing the received RF signal to produce a first intermediate frequency signal;
filtering an image signal of the first intermediate frequency signal using a notch filter;
passing the first intermediate frequency signal using a band-pass filter; and
mixing the passed first intermediate frequency signal to produce an output signal.

- [c11] 11. The method of claim 10, wherein the output signal is a second intermediate frequency signal.
- [c12] 12. The method of claim 10, wherein the output signal includes an in-phase baseband signal and a quadrature-phase baseband signal.